Econometriscs assignment

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# MSB104 Econometrics

This is a collection of assignments in the subject econometrics MSB104.

#Assignment 1 In this assignment we are looking at five European countries: Denmark, France, Hungary, Portugal and Slovakia. In the first assignment we have collected data from Eurostats, the data contains GDP and populations for the countries but also at NUTS3 level for the last 20 years.

We collected 2 datasets, and the first thing we did was to clean the list and remove data that didn’t have any valuables. We changed the names on some of the variables and merged the two datasets into one dataset called BNP2.

Then we calculated the GDP pr capita. We did that by divide the GDP and the population. To get the right number we multiplied with a million.

We have divided the countries into NUTS3 levels. To get the result by country, we made a summary of GDP per capita on every country. By creating such a summary for each country, we can get an overview of whether there are major inequality within the various regions. If we find such deviations, we can choose to remove some of our regions in order not to have large inequalities.

Brief about what we can find in the summary. We find the min and max. i.e. the smallest and the highest GDP per capita for the country. we also find 1st quartile and 3rd quartile. The first quartile is the observation between the median and the lowest value, and looks at the 25% lowest values from the 75% highest. The median looks at the value that is observed the most times in the middle of the observations. The third quartile is then, naturally enough, the value between the median and the highest value. we also find mean which tell us what the average observation for all regions is.

##Denmark

Denmark are missing observations for some of the years, so there are less data to be collected about them. Denmark is also a small country so there are not that many NUTS2 regions.

**Country level**

summarise(DK, GDP\_per\_Capita = mean(Per\_capita))

## `summarise()` has grouped output by 'Regio\_id'. You can override using the  
## `.groups` argument.

## # A tibble: 154 × 3  
## # Groups: Regio\_id [11]  
## Regio\_id Year GDP\_per\_Capita  
## <chr> <dbl> <dbl>  
## 1 DK011 2007 59142.  
## 2 DK011 2008 59920.  
## 3 DK011 2009 58406.  
## 4 DK011 2010 64695.  
## 5 DK011 2011 62798.  
## 6 DK011 2012 64038.  
## 7 DK011 2013 64435.  
## 8 DK011 2014 67811.  
## 9 DK011 2015 68399.  
## 10 DK011 2016 69961.  
## # … with 144 more rows

summary(DK)

## Year Regio\_id Per\_capita Population   
## Min. :2007 Length:154 Min. :27606 Min. : 39583   
## 1st Qu.:2010 Class :character 1st Qu.:35172 1st Qu.:429180   
## Median :2014 Mode :character Median :40004 Median :528003   
## Mean :2014 Mean :44209 Mean :512116   
## 3rd Qu.:2017 3rd Qu.:48033 3rd Qu.:675962   
## Max. :2020 Max. :86083 Max. :897129

##France

France is a large country, it has over a hundred NUTS3 regions.

summary(FR)

## Year Regio\_id Per\_capita Population   
## Min. :2002 Length:1630 Min. : 8292 Min. : 74857   
## 1st Qu.:2006 Class :character 1st Qu.: 22050 1st Qu.: 279223   
## Median :2011 Mode :character Median : 24476 Median : 526667   
## Mean :2011 Mean : 26869 Mean : 642083   
## 3rd Qu.:2016 3rd Qu.: 28270 3rd Qu.: 833425   
## Max. :2020 Max. :116235 Max. :2249975

In the summary of France there are a hug differense in min and max. this is because France has colonies in other countries that are counted, these colonies are located in Africa and South America which have a negative effect on the overall GDP of France. ’further research then these countries should be removed from the data set.

**Country level**

summarise(FR, GDP\_per\_Capita = mean(Per\_capita))

## `summarise()` has grouped output by 'Regio\_id'. You can override using the  
## `.groups` argument.

## # A tibble: 1,630 × 3  
## # Groups: Regio\_id [87]  
## Regio\_id Year GDP\_per\_Capita  
## <chr> <dbl> <dbl>  
## 1 FR101 2002 75369.  
## 2 FR101 2003 75357.  
## 3 FR101 2004 76586.  
## 4 FR101 2005 79258.  
## 5 FR101 2006 80305.  
## 6 FR101 2007 85155.  
## 7 FR101 2008 85583.  
## 8 FR101 2009 81539.  
## 9 FR101 2010 87627.  
## 10 FR101 2011 88674.  
## # … with 1,620 more rows

summary(FR1)

## Year Regio\_id Per\_capita Population   
## Min. :2002 Length:1558 Min. : 16619 Min. : 74857   
## 1st Qu.:2006 Class :character 1st Qu.: 22286 1st Qu.: 281079   
## Median :2011 Mode :character Median : 24670 Median : 534055   
## Mean :2011 Mean : 27290 Mean : 650912   
## 3rd Qu.:2016 3rd Qu.: 28532 3rd Qu.: 899310   
## Max. :2020 Max. :116235 Max. :2249975

##Hungary

**Country level**

summarise(HU, GDP\_per\_Capita = mean(Per\_capita))

## `summarise()` has grouped output by 'Regio\_id'. You can override using the  
## `.groups` argument.

## # A tibble: 380 × 3  
## # Groups: Regio\_id [20]  
## Regio\_id Year GDP\_per\_Capita  
## <chr> <dbl> <dbl>  
## 1 HU110 2002 14449.  
## 2 HU110 2003 15013.  
## 3 HU110 2004 17088.  
## 4 HU110 2005 19097.  
## 5 HU110 2006 19739.  
## 6 HU110 2007 21939.  
## 7 HU110 2008 23699.  
## 8 HU110 2009 21452.  
## 9 HU110 2010 21946.  
## 10 HU110 2011 22268.  
## # … with 370 more rows

summary(HU)

## Year Regio\_id Per\_capita Population   
## Min. :2002 Length:380 Min. : 3773 Min. : 188092   
## 1st Qu.:2006 Class :character 1st Qu.: 6330 1st Qu.: 305718   
## Median :2011 Mode :character Median : 7754 Median : 393302   
## Mean :2011 Mean : 8782 Mean : 498087   
## 3rd Qu.:2016 3rd Qu.: 9907 3rd Qu.: 536535   
## Max. :2020 Max. :31013 Max. :1759407

## Portugal

**Country level**

summarise(PT, GDP\_per\_Capita = mean(Per\_capita))

## GDP\_per\_Capita  
## 1 14415.77

**Regional level (NUTS3)**

##Slovakia Slovakia is a country in central Europe. it is similar to Denmark, a country that does not have so many NUTS 3 regions. We therefore have to keep an eye on any outcomes.

**Country level**

summarise(SK, GDP\_per\_Capita = mean(Per\_capita))

## `summarise()` has grouped output by 'Regio\_id'. You can override using the  
## `.groups` argument.

## # A tibble: 152 × 3  
## # Groups: Regio\_id [8]  
## Regio\_id Year GDP\_per\_Capita  
## <chr> <dbl> <dbl>  
## 1 SK010 2002 11478.  
## 2 SK010 2003 12994.  
## 3 SK010 2004 15023.  
## 4 SK010 2005 18295.  
## 5 SK010 2006 20452.  
## 6 SK010 2007 25868.  
## 7 SK010 2008 29882.  
## 8 SK010 2009 30925.  
## 9 SK010 2010 32670.  
## 10 SK010 2011 33733.  
## # … with 142 more rows

summary(SK)

## Year Regio\_id Per\_capita Population   
## Min. :2002 Length:152 Min. : 2976 Min. :549924   
## 1st Qu.:2006 Class :character 1st Qu.: 7829 1st Qu.:597302   
## Median :2011 Mode :character Median :11057 Median :671949   
## Mean :2011 Mean :12493 Mean :675337   
## 3rd Qu.:2016 3rd Qu.:13655 3rd Qu.:725897   
## Max. :2020 Max. :40095 Max. :826244

### Descriptive Statistics regional inequity (Gini Nuts2)

We are trying to get the Nuts2 regions, but we only get the nuts 3.

## # A tibble: 154 × 5  
## # Groups: Regio\_id, Year [154]  
## Year Regio\_id Per\_capita Population id\_nuts2  
## <dbl> <chr> <dbl> <dbl> <chr>   
## 1 2007 DK011 59142. 648889 DK01   
## 2 2008 DK011 59920. 656582 DK01   
## 3 2009 DK011 58406. 667228 DK01   
## 4 2010 DK011 64695. 678873 DK01   
## 5 2011 DK011 62798. 692876 DK01   
## 6 2012 DK011 64038. 704108 DK01   
## 7 2013 DK011 64435. 716958 DK01   
## 8 2014 DK011 67811. 728243 DK01   
## 9 2015 DK011 68399. 739977 DK01   
## 10 2016 DK011 69961. 752964 DK01   
## # … with 144 more rows

## # A tibble: 154 × 5  
## # Groups: Regio\_id, Year [154]  
## Year Regio\_id Per\_capita Population id\_nuts0  
## <dbl> <chr> <dbl> <dbl> <chr>   
## 1 2007 DK011 59142. 648889 DK   
## 2 2008 DK011 59920. 656582 DK   
## 3 2009 DK011 58406. 667228 DK   
## 4 2010 DK011 64695. 678873 DK   
## 5 2011 DK011 62798. 692876 DK   
## 6 2012 DK011 64038. 704108 DK   
## 7 2013 DK011 64435. 716958 DK   
## 8 2014 DK011 67811. 728243 DK   
## 9 2015 DK011 68399. 739977 DK   
## 10 2016 DK011 69961. 752964 DK   
## # … with 144 more rows

## [1] 0.1564112

## # A tibble: 154 × 5  
## Year Regio\_id Per\_capita Population gini\_n2  
## <dbl> <chr> <dbl> <dbl> <dbl>  
## 1 2007 DK011 59142. 648889 0  
## 2 2008 DK011 59920. 656582 0  
## 3 2009 DK011 58406. 667228 0  
## 4 2010 DK011 64695. 678873 0  
## 5 2011 DK011 62798. 692876 0  
## 6 2012 DK011 64038. 704108 0  
## 7 2013 DK011 64435. 716958 0  
## 8 2014 DK011 67811. 728243 0  
## 9 2015 DK011 68399. 739977 0  
## 10 2016 DK011 69961. 752964 0  
## # … with 144 more rows

## Warning: Unknown or uninitialised column: `gini\_n2`.

## Length Class Mode   
## 0 NULL NULL

## # A tibble: 1,558 × 5  
## # Groups: Regio\_id, Year [1,558]  
## Year Regio\_id Per\_capita Population id\_nuts2  
## <dbl> <chr> <dbl> <dbl> <chr>   
## 1 2002 FR101 75369. 2145472 FR10   
## 2 2003 FR101 75357. 2154521 FR10   
## 3 2004 FR101 76586. 2161932 FR10   
## 4 2005 FR101 79258. 2172186 FR10   
## 5 2006 FR101 80305. 2181371 FR10   
## 6 2007 FR101 85155. 2193030 FR10   
## 7 2008 FR101 85583. 2211297 FR10   
## 8 2009 FR101 81539. 2234105 FR10   
## 9 2010 FR101 87627. 2243833 FR10   
## 10 2011 FR101 88674. 2249975 FR10   
## # … with 1,548 more rows

## # A tibble: 1,558 × 5  
## # Groups: Regio\_id, Year [1,558]  
## Year Regio\_id Per\_capita Population id\_nuts0  
## <dbl> <chr> <dbl> <dbl> <chr>   
## 1 2002 FR101 75369. 2145472 FR   
## 2 2003 FR101 75357. 2154521 FR   
## 3 2004 FR101 76586. 2161932 FR   
## 4 2005 FR101 79258. 2172186 FR   
## 5 2006 FR101 80305. 2181371 FR   
## 6 2007 FR101 85155. 2193030 FR   
## 7 2008 FR101 85583. 2211297 FR   
## 8 2009 FR101 81539. 2234105 FR   
## 9 2010 FR101 87627. 2243833 FR   
## 10 2011 FR101 88674. 2249975 FR   
## # … with 1,548 more rows

## [1] 0.2157499

## # A tibble: 1,558 × 5  
## Year Regio\_id Per\_capita Population gini\_n2  
## <dbl> <chr> <dbl> <dbl> <dbl>  
## 1 2002 FR101 75369. 2145472 0  
## 2 2003 FR101 75357. 2154521 0  
## 3 2004 FR101 76586. 2161932 0  
## 4 2005 FR101 79258. 2172186 0  
## 5 2006 FR101 80305. 2181371 0  
## 6 2007 FR101 85155. 2193030 0  
## 7 2008 FR101 85583. 2211297 0  
## 8 2009 FR101 81539. 2234105 0  
## 9 2010 FR101 87627. 2243833 0  
## 10 2011 FR101 88674. 2249975 0  
## # … with 1,548 more rows

## Warning: Unknown or uninitialised column: `gini\_n2`.

## Length Class Mode   
## 0 NULL NULL

## # A tibble: 380 × 5  
## # Groups: Regio\_id, Year [380]  
## Year Regio\_id Per\_capita Population id\_nuts2  
## <dbl> <chr> <dbl> <dbl> <chr>   
## 1 2002 HU110 14449. 1739569 HU11   
## 2 2003 HU110 15013. 1719342 HU11   
## 3 2004 HU110 17088. 1705309 HU11   
## 4 2005 HU110 19097. 1697343 HU11   
## 5 2006 HU110 19739. 1698106 HU11   
## 6 2007 HU110 21939. 1696128 HU11   
## 7 2008 HU110 23699. 1702297 HU11   
## 8 2009 HU110 21452. 1712210 HU11   
## 9 2010 HU110 21946. 1721556 HU11   
## 10 2011 HU110 22268. 1733685 HU11   
## # … with 370 more rows

## # A tibble: 380 × 5  
## # Groups: Regio\_id, Year [380]  
## Year Regio\_id Per\_capita Population id\_nuts0  
## <dbl> <chr> <dbl> <dbl> <chr>   
## 1 2002 HU110 14449. 1739569 HU   
## 2 2003 HU110 15013. 1719342 HU   
## 3 2004 HU110 17088. 1705309 HU   
## 4 2005 HU110 19097. 1697343 HU   
## 5 2006 HU110 19739. 1698106 HU   
## 6 2007 HU110 21939. 1696128 HU   
## 7 2008 HU110 23699. 1702297 HU   
## 8 2009 HU110 21452. 1712210 HU   
## 9 2010 HU110 21946. 1721556 HU   
## 10 2011 HU110 22268. 1733685 HU   
## # … with 370 more rows

## [1] 0.2851074

## # A tibble: 380 × 5  
## Year Regio\_id Per\_capita Population gini\_n2  
## <dbl> <chr> <dbl> <dbl> <dbl>  
## 1 2002 HU110 14449. 1739569 0  
## 2 2003 HU110 15013. 1719342 0  
## 3 2004 HU110 17088. 1705309 0  
## 4 2005 HU110 19097. 1697343 0  
## 5 2006 HU110 19739. 1698106 0  
## 6 2007 HU110 21939. 1696128 0  
## 7 2008 HU110 23699. 1702297 0  
## 8 2009 HU110 21452. 1712210 0  
## 9 2010 HU110 21946. 1721556 0  
## 10 2011 HU110 22268. 1733685 0  
## # … with 370 more rows

## Warning: Unknown or uninitialised column: `gini\_n2`.

## Length Class Mode   
## 0 NULL NULL

PT2 <-PT %>%  
select(Regio\_id) filter (temp\_var == 4) %>%

## Year Regio\_id Per\_capita Population id\_nuts2  
## 1 2002 PT111 8953.695 250491 PT11  
## 2 2003 PT111 9058.101 250823 PT11  
## 3 2004 PT111 9345.326 250476 PT11  
## 4 2005 PT111 9775.480 250134 PT11  
## 5 2006 PT111 10446.806 249616 PT11  
## 6 2007 PT111 10864.557 248983 PT11  
## 7 2008 PT111 11333.320 248515 PT11  
## 8 2009 PT111 11629.144 247492 PT11  
## 9 2010 PT111 12326.766 246690 PT11  
## 10 2011 PT111 11904.030 245306 PT11  
## 11 2012 PT111 11804.431 244149 PT11  
## 12 2013 PT111 12503.397 242159 PT11  
## 13 2014 PT111 12682.877 240134 PT11  
## 14 2015 PT111 12899.448 237997 PT11  
## 15 2016 PT111 13665.764 236270 PT11  
## 16 2017 PT111 14563.091 233813 PT11  
## 17 2018 PT111 15506.680 232178 PT11  
## 18 2019 PT111 16102.038 230954 PT11  
## 19 2020 PT111 15384.963 230412 PT11  
## 20 2002 PT112 10440.365 395672 PT11  
## 21 2003 PT112 10393.062 398843 PT11  
## 22 2004 PT112 10851.611 401040 PT11  
## 23 2005 PT112 11208.288 403066 PT11  
## 24 2006 PT112 11688.857 404978 PT11  
## 25 2007 PT112 12419.254 406832 PT11  
## 26 2008 PT112 12942.032 408415 PT11  
## 27 2009 PT112 12775.853 409348 PT11  
## 28 2010 PT112 12935.466 410296 PT11  
## 29 2011 PT112 12737.175 410383 PT11  
## 30 2012 PT112 12528.465 411028 PT11  
## 31 2013 PT112 12900.266 410090 PT11  
## 32 2014 PT112 13398.891 408851 PT11  
## 33 2015 PT112 13970.129 407420 PT11  
## 34 2016 PT112 14918.702 406530 PT11  
## 35 2017 PT112 15875.516 404664 PT11  
## 36 2018 PT112 16765.218 403953 PT11  
## 37 2019 PT112 18019.070 403891 PT11  
## 38 2020 PT112 17287.857 404444 PT11  
## 39 2002 PT119 10429.791 427557 PT11  
## 40 2003 PT119 10340.674 428797 PT11  
## 41 2004 PT119 10450.233 429378 PT11  
## 42 2005 PT119 10714.806 429809 PT11  
## 43 2006 PT119 11094.462 429846 PT11  
## 44 2007 PT119 11806.792 429961 PT11  
## 45 2008 PT119 12051.809 429767 PT11  
## 46 2009 PT119 11699.884 428588 PT11  
## 47 2010 PT119 12276.999 427475 PT11  
## 48 2011 PT119 12243.235 425720 PT11  
## 49 2012 PT119 12349.757 425661 PT11  
## 50 2013 PT119 12819.920 423817 PT11  
## 51 2014 PT119 13417.857 421931 PT11  
## 52 2015 PT119 14390.366 419826 PT11  
## 53 2016 PT119 15011.627 418411 PT11  
## 54 2017 PT119 15667.295 415671 PT11  
## 55 2018 PT119 16715.049 413854 PT11  
## 56 2019 PT119 17094.063 412669 PT11  
## 57 2020 PT119 16501.261 411857 PT11  
## 58 2002 PT11A 13217.364 1736891 PT11  
## 59 2003 PT11A 13220.582 1744924 PT11  
## 60 2004 PT11A 13569.231 1750262 PT11  
## 61 2005 PT11A 14172.296 1754298 PT11  
## 62 2006 PT11A 14750.047 1757869 PT11  
## 63 2007 PT11A 15725.812 1761628 PT11  
## 64 2008 PT11A 16012.199 1764381 PT11  
## 65 2009 PT11A 15340.055 1763995 PT11  
## 66 2010 PT11A 15762.388 1763670 PT11  
## 67 2011 PT11A 15485.712 1761075 PT11  
## 68 2012 PT11A 14928.200 1758991 PT11  
## 69 2013 PT11A 15182.166 1750297 PT11  
## 70 2014 PT11A 15703.244 1740983 PT11  
## 71 2015 PT11A 16432.428 1731354 PT11  
## 72 2016 PT11A 17200.128 1723618 PT11  
## 73 2017 PT11A 18228.719 1719021 PT11  
## 74 2018 PT11A 19198.611 1719702 PT11  
## 75 2019 PT11A 19997.196 1722374 PT11  
## 76 2020 PT11A 18716.887 1728226 PT11  
## 77 2002 PT11B 7211.800 104103 PT11  
## 78 2003 PT11B 7410.080 103397 PT11  
## 79 2004 PT11B 7963.947 102571 PT11  
## 80 2005 PT11B 8631.465 101605 PT11  
## 81 2006 PT11B 9146.731 100531 PT11  
## 82 2007 PT11B 9713.157 99497 PT11  
## 83 2008 PT11B 10345.942 98369 PT11  
## 84 2009 PT11B 10511.204 97104 PT11  
## 85 2010 PT11B 10831.090 95850 PT11  
## 86 2011 PT11B 10806.963 94391 PT11  
## 87 2012 PT11B 10337.766 93615 PT11  
## 88 2013 PT11B 11116.944 92395 PT11  
## 89 2014 PT11B 10805.465 91264 PT11  
## 90 2015 PT11B 10944.231 90211 PT11  
## 91 2016 PT11B 11585.145 89260 PT11  
## 92 2017 PT11B 11988.492 87941 PT11  
## 93 2018 PT11B 12540.702 87157 PT11  
## 94 2019 PT11B 13284.065 86466 PT11  
## 95 2020 PT11B 12640.916 86133 PT11  
## 96 2002 PT11C 7545.630 435077 PT11  
## 97 2003 PT11C 7555.301 436475 PT11  
## 98 2004 PT11C 7717.078 437089 PT11  
## 99 2005 PT11C 8165.853 437364 PT11  
## 100 2006 PT11C 8820.730 437440 PT11  
## 101 2007 PT11C 9456.351 437562 PT11  
## 102 2008 PT11C 9607.315 437399 PT11  
## 103 2009 PT11C 9564.718 436338 PT11  
## 104 2010 PT11C 9918.724 435183 PT11  
## 105 2011 PT11C 9866.225 433340 PT11  
## 106 2012 PT11C 9607.295 432946 PT11  
## 107 2013 PT11C 9937.393 430620 PT11  
## 108 2014 PT11C 10261.626 428054 PT11  
## 109 2015 PT11C 10740.998 425588 PT11  
## 110 2016 PT11C 11158.885 423683 PT11  
## 111 2017 PT11C 11539.893 420854 PT11  
## 112 2018 PT11C 12114.823 418768 PT11  
## 113 2019 PT11C 12615.441 417268 PT11  
## 114 2020 PT11C 12274.772 415989 PT11  
## 115 2002 PT11D 7865.345 219895 PT11  
## 116 2003 PT11D 8148.623 219010 PT11  
## 117 2004 PT11D 8426.020 217741 PT11  
## 118 2005 PT11D 9074.702 216298 PT11  
## 119 2006 PT11D 9728.166 214543 PT11  
## 120 2007 PT11D 10133.843 213160 PT11  
## 121 2008 PT11D 10702.923 211602 PT11  
## 122 2009 PT11D 10919.847 209524 PT11  
## 123 2010 PT11D 11470.292 207707 PT11  
## 124 2011 PT11D 11515.950 205574 PT11  
## 125 2012 PT11D 11199.093 204121 PT11  
## 126 2013 PT11D 11633.530 201741 PT11  
## 127 2014 PT11D 11997.743 199400 PT11  
## 128 2015 PT11D 12381.979 197210 PT11  
## 129 2016 PT11D 13053.107 195247 PT11  
## 130 2017 PT11D 13370.255 193202 PT11  
## 131 2018 PT11D 14425.242 192046 PT11  
## 132 2019 PT11D 15260.621 191101 PT11  
## 133 2020 PT11D 14561.119 190815 PT11  
## 134 2002 PT11E 8773.757 126647 PT11  
## 135 2003 PT11E 9047.808 126025 PT11  
## 136 2004 PT11E 9679.909 125183 PT11  
## 137 2005 PT11E 10439.515 124296 PT11  
## 138 2006 PT11E 10931.612 123238 PT11  
## 139 2007 PT11E 11524.760 122275 PT11  
## 140 2008 PT11E 12319.637 121325 PT11  
## 141 2009 PT11E 12498.398 120165 PT11  
## 142 2010 PT11E 13055.353 119109 PT11  
## 143 2011 PT11E 13063.771 117796 PT11  
## 144 2012 PT11E 11869.543 116713 PT11  
## 145 2013 PT11E 12332.537 115115 PT11  
## 146 2014 PT11E 13091.268 113578 PT11  
## 147 2015 PT11E 13520.356 112179 PT11  
## 148 2016 PT11E 13958.595 110759 PT11  
## 149 2017 PT11E 13539.380 109409 PT11  
## 150 2018 PT11E 15357.126 108547 PT11  
## 151 2019 PT11E 15781.754 107860 PT11  
## 152 2020 PT11E 15585.788 107462 PT11  
## 153 2002 PT16B 11579.618 341589 PT16  
## 154 2003 PT16B 12005.881 344861 PT16  
## 155 2004 PT16B 12542.509 347515 PT16  
## 156 2005 PT16B 12784.543 349982 PT16  
## 157 2006 PT16B 13282.187 352256 PT16  
## 158 2007 PT16B 13934.903 354794 PT16  
## 159 2008 PT16B 13705.096 357181 PT16  
## 160 2009 PT16B 13579.391 359265 PT16  
## 161 2010 PT16B 13528.142 361380 PT16  
## 162 2011 PT16B 12999.601 363065 PT16  
## 163 2012 PT16B 12723.103 362311 PT16  
## 164 2013 PT16B 13084.837 361374 PT16  
## 165 2014 PT16B 13367.353 360090 PT16  
## 166 2015 PT16B 13981.397 358442 PT16  
## 167 2016 PT16B 14689.649 358594 PT16  
## 168 2017 PT16B 15460.060 358029 PT16  
## 169 2018 PT16B 16158.186 357706 PT16  
## 170 2019 PT16B 17140.519 356785 PT16  
## 171 2020 PT16B 16119.945 358714 PT16  
## 172 2002 PT16D 13492.573 366177 PT16  
## 173 2003 PT16D 13674.039 367639 PT16  
## 174 2004 PT16D 14103.580 368622 PT16  
## 175 2005 PT16D 14606.561 369028 PT16  
## 176 2006 PT16D 14957.824 369519 PT16  
## 177 2007 PT16D 15755.107 370014 PT16  
## 178 2008 PT16D 15667.828 370417 PT16  
## 179 2009 PT16D 15385.371 370656 PT16  
## 180 2010 PT16D 15675.705 370761 PT16  
## 181 2011 PT16D 15376.811 370703 PT16  
## 182 2012 PT16D 15019.375 369287 PT16  
## 183 2013 PT16D 15285.319 367764 PT16  
## 184 2014 PT16D 15845.512 366086 PT16  
## 185 2015 PT16D 16863.306 364457 PT16  
## 186 2016 PT16D 17710.485 364313 PT16  
## 187 2017 PT16D 18679.732 363752 PT16  
## 188 2018 PT16D 19732.109 363095 PT16  
## 189 2019 PT16D 20365.258 362100 PT16  
## 190 2020 PT16D 19539.943 363803 PT16  
## 191 2002 PT16E 12189.414 472131 PT16  
## 192 2003 PT16E 12614.214 471855 PT16  
## 193 2004 PT16E 13139.056 470839 PT16  
## 194 2005 PT16E 13551.063 469665 PT16  
## 195 2006 PT16E 14078.097 468466 PT16  
## 196 2007 PT16E 14742.503 467268 PT16  
## 197 2008 PT16E 14970.726 465946 PT16  
## 198 2009 PT16E 14937.266 464502 PT16  
## 199 2010 PT16E 15505.225 462962 PT16  
## 200 2011 PT16E 15193.238 461011 PT16  
## 201 2012 PT16E 14517.227 456871 PT16  
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## 363 2003 PT185 13520.760 243189 0.1619237  
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## 454 2018 PT300 19422.176 254368 0.1619237  
## 455 2019 PT300 20186.970 253945 0.1619237  
## 456 2020 PT300 17548.239 254254 0.1619237

## Length Class Mode   
## 0 NULL NULL

SK %>%  
 mutate(id\_nuts2 = substr(Regio\_id,1,4))

## # A tibble: 152 × 5  
## # Groups: Regio\_id, Year [152]  
## Year Regio\_id Per\_capita Population id\_nuts2  
## <dbl> <chr> <dbl> <dbl> <chr>   
## 1 2002 SK010 11478. 599042 SK01   
## 2 2003 SK010 12994. 596720 SK01   
## 3 2004 SK010 15023. 594113 SK01   
## 4 2005 SK010 18295. 592759 SK01   
## 5 2006 SK010 20452. 592301 SK01   
## 6 2007 SK010 25868. 592062 SK01   
## 7 2008 SK010 29882. 592824 SK01   
## 8 2009 SK010 30925. 594966 SK01   
## 9 2010 SK010 32670. 597999 SK01   
## 10 2011 SK010 33733. 599931 SK01   
## # … with 142 more rows

SK %>%  
 mutate(id\_nuts0 = substr(Regio\_id,1,2))

## # A tibble: 152 × 5  
## # Groups: Regio\_id, Year [152]  
## Year Regio\_id Per\_capita Population id\_nuts0  
## <dbl> <chr> <dbl> <dbl> <chr>   
## 1 2002 SK010 11478. 599042 SK   
## 2 2003 SK010 12994. 596720 SK   
## 3 2004 SK010 15023. 594113 SK   
## 4 2005 SK010 18295. 592759 SK   
## 5 2006 SK010 20452. 592301 SK   
## 6 2007 SK010 25868. 592062 SK   
## 7 2008 SK010 29882. 592824 SK   
## 8 2009 SK010 30925. 594966 SK   
## 9 2010 SK010 32670. 597999 SK   
## 10 2011 SK010 33733. 599931 SK   
## # … with 142 more rows

gini.wtd(SK$Per\_capita, w = SK$Population)

## [1] 0.3026474

SK %>%  
 mutate(gini\_n2 = gini.wtd(Per\_capita, w = Population)) %>%  
ungroup()

## # A tibble: 152 × 5  
## Year Regio\_id Per\_capita Population gini\_n2  
## <dbl> <chr> <dbl> <dbl> <dbl>  
## 1 2002 SK010 11478. 599042 0  
## 2 2003 SK010 12994. 596720 0  
## 3 2004 SK010 15023. 594113 0  
## 4 2005 SK010 18295. 592759 0  
## 5 2006 SK010 20452. 592301 0  
## 6 2007 SK010 25868. 592062 0  
## 7 2008 SK010 29882. 592824 0  
## 8 2009 SK010 30925. 594966 0  
## 9 2010 SK010 32670. 597999 0  
## 10 2011 SK010 33733. 599931 0  
## # … with 142 more rows

summary(SK$gini\_n2)

## Warning: Unknown or uninitialised column: `gini\_n2`.

## Length Class Mode   
## 0 NULL NULL